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10/805,708	03/22/2004	Tomohisa Moridaira	450100-04972	8806

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EXAMINER
JEN, MINGJEN

ART UNIT	PAPER NUMBER
3664	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/805,708	MORIDAIRA ET AL.
Office Action Summary	Examiner	Art Unit	
	IAN JEN	3664	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>24 August 2009</u>.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-16</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>1-16</u> is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>22 March 2004</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☒ All b) ☐ Some * c) ☐ None of:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>09/02/2008</u>.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 08-06)   **Office Action Summary**   Part of Paper No./Mail Date 20091102

DETAILED ACTION

Response to Amendment

1.   This action is in response to the amendment filed on August 24th, 2009.

2.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b),
by another filed in the United States before the invention by the applicant for patent or (2) a
patent granted on an application for patent by another filed in the United States before the
invention by the applicant for patent, except that an international application filed under the
treaty defined in section 351(a) shall have the effects for purposes of this subsection of an
application filed in the United States only if the international application designated the United
States and was published under Article 21(2) of such treaty in the English language.

3.   Claim 1, 3, 6, 8, 11-13, 15 are rejected under 35 U.S.C. 102(e) as being anticipated by

Yamamoto (U.S. Pat NO. 6,330,494).

    As to Claim 1, Yamamoto discloses a movable robot apparatus comprising: a safety level

status detecting means (Column 1, lines 44 -55; See Central Control Unit 102, Column 4, lines

56 - 61) for detecting a safety level status; safety level detecting means (Column 1, lines 45-55;

See External Editing Computer 400 in Column 5, lines 61-65) for detecting a safety level of

safety level status detecting means; wherein the safety level of the detected safety level status is

determined by comparing the detected safety level status to a plurality of threshold values (Fig

9, Column 7,lines 15 - 45; Column 7, lines 65 - Col 8,lines 20 where the threshold value is the

tolerable range along with the average acceleration range) and grouping the detect safety level

status as a function of the comparison result (Column 5,lines 10-25 where the sensor output are

group of the status ; Column 7,lines 35 - 45; Column 8, lines 15 - 35 where the status is

compared); control means (Column 1, lines 45-55; See Control Section 100 in Column 7, lines

18-24) performing a control process so as to implement prescribed countermeasurement

according to safety level status by safety level status detecting means and safety level detected

by safety level detecting means; wherein the safety level is a volume calculated as function of a

joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of

a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9,lines 20

where formula 14 examine tolerable angle range, capability of a joint angle; related to timing of

a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-

19; Fig 9, S18, col 8,lines 40 - 55, restore to normal posture as planned move); when the safety

level increases and the countermeasures are performed (col 8, lines 20 – 65 the angle range is

the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety

level status(col 8, lines 15 – 35, lines 45 -55), the control means determines whether to maintain

current countermeasures (col 8, lines 15 – 35, lines 45 -55).

As to Claim 3, Yamamoto discloses a movable robot apparatus according to claim 1,

wherein: control means performs control process so as to implement countermeasures according

to a position of said safety level status detected (Column 7, lines 18-25) by safety level status

detecting means and safety level of the safety level status (Column 5, lines 61-65; Column 4,

lines 57- 61).

As to claim 6, Yamamoto discloses a control method of a movable robot apparatus. The

method comprises: a first step of detecting a safety level of safety level status detected

(Abstract; Column 4, lines 40-50; Column 5, lines 61 - 65); determining the safety level of the

detected safety level status by comparing the detected safety level status to a plurality of

threshold values (Fig 9, Column 7,lines 15 - 45; Column 7, lines 65 - Col 8,lines 20 where the

threshold value is the tolerable range along with the average acceleration range) and grouping the

detected safety level status to a plurality of threshold values and grouping the detected safety

level status as a function of the comparison result (Column 5,lines 10-25 where the sensor

output are group of the status ; Column 7,lines 35 - 45; Column 8, lines 15 - 35 where the status

is compared) and a second step of performing a control so as to make said robot apparatus

implement prescribed countermeasures according to safety level status detected and safety level

detected (Column 8, lines 18-31; Column 5, lines 61-65; Column 4, lines 48- 50); wherein the

safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the

angle range is the safety level volume), capability of a joint angle, a timing of a potential risk,

and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine tolerable angle

range, capability of a joint angle; related to timing of a potential risk in acceleration from

formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8,lines 40 - 55,

restore to normal posture as planned move); when the safety level increases while the

countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level volume;

col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8, lines 15

– 35, lines 45 -55), the control means determines whether to maintain current countermeasures

(col 8, lines 15 – 35, lines 45 -55).

    As to claim 8, Yamamoto discloses the control method according to claim 6, wherein: , in

second step, control process is performed so as to make robot apparatus implement

countermeasures according to a position of safety level status detected and safety level

detected(Column 7, lines 19- 25).

    As to claim 11, Yamamoto discloses a movable robot comprising: safety level status

detecting means for detecting a safety level status (Column 1, lines 44 -55; See Central Control

Unit 102 in Abstract, Column 4, lines 56 – 61; Column 4, lines 40- 50) ; and control means for

performing a control process so as to implement prescribed countermeasures according to a

position of said safety level status detected by said safety level status detecting means (See

Control Section 100 in Column 4 , lines 57 – 61; Column 7, lines 18 – 25; Column 9, lines 7 -

20); where in the position of the detected safety level status is determined by comparing the

detected safety level status to a plurality of threshold values (Fig 9, Column 7,lines 15 - 45;

Column 7, lines 65 - Col 8,lines 20 where the threshold value is the tolerable range along with

the average acceleration range) and grouping the detected safety level status as a function of the

comparison result (Column 5,lines 10-25 where the sensor output are group of the status ;
Column 7,lines 35 - 45; Column 8, lines 15 - 35 where the status is compared); wherein the
safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the
angle range is the safety level volume), capability of a joint angle, a timing of a potential risk,
and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine tolerable angle
range, capability of a joint angle; related to timing of a potential risk in acceleration from
formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8,lines 40 - 55,
restore to normal posture as planned move); when the safety level increases while the
countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level volume;
col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8, lines 15
– 35, lines 45 -55), the control means determines whether to maintain current countermeasures (
col 8, lines 15 – 35, lines 45 -55).

     As to claim 12, Yamamoto discloses a control method of a movable robot apparatus,
comprising: a first step of detecting a safety level status (Column 10, lines 8 - 45); determining
the position of the detected safety level status by comparing the detected safety level status to a
plurality of threshold values (Fig 9, Column 7,lines 15 - 45; Column 7, lines 65 - Col 8,lines 20
where the threshold value is the tolerable range along with the average acceleration range) and
grouping the detected safety level status as a function of the comparison result (Column 5,lines
10-25 where the sensor output are group of the status ; Column 7,lines 35 - 45; Column 8, lines
15 - 35 where the status is compared); and a second step of performing a control process so as to
make robot apparatus implement prescribed countermeasures according to a position of safety

level status detected in first step (Column 7, lines 18 - 25); wherein the safety level is a volume

calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety

level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col

7, lines 35 – Col 9,lines 20 where formula 14 examine tolerable angle range, capability of a joint

angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure

calculated in formula 16-19; Fig 9, S18, col 8,lines 40 - 55, restore to normal posture as planned

move); determining whether to maintain current countermeasures when the safety level

increases and the countermeasures are performed (col 8, lines 15 – 35, lines 45 -55),

corresponding to a different safety level status (col 8, lines 20 – 65 the angle range is the safety

level volume; col 8, lines 15 – 35, lines 45 -55; col 8, lines 15 – 35, lines 45 -55   ).

   As to claim 13, Yamamoto discloses a robot apparatus having a plurality of movable units,

comprising: a driving means for driving said movable units (See servo motor in Column 3, lines

40 – Column 4, lines 38); control means for controlling said driving units (See Control Section

100 in Column 4, lines 57 – 61); object detecting means for detecting an object(See CCD

Camera in Column 4, lines 40- 48); action determination means for determining an action of

robot apparatus (See External Editing Commander Computer 400 in Column 7, lines 4-16); and

safety level detecting means for detecting safety level involving object and movable units(See

CPU 102 in Column 5, lines 11- 26); wherein control means moves movable units as a function

of safety level and action determined by action determination unit to mitigate or avoid danger (

See External Editing Computer 400, CPU 102, Control Section 100 in Abstract; Column 7, lines

4 - 25; Column 8 ,lines 40 - Col 9, lines 5 where the control section move the movable unit with

respect to the angle function defined as safety level), wherein the action determined is

preprogrammed countermeasure corresponding to the detected safety level (Column 8, lines 40 -

Column 9, lines 20, control section 00; where the action corresponding to angle and acceleration

value of the robot respectively to the preprogrammed countermeasure in control section 100);

wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65

where the angle range is the safety level volume), capability of a joint angle, a timing of a

potential risk, and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine

tolerable angle range, capability of a joint angle; related to timing of a potential risk in

acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col

8,lines 40 - 55, restore to normal posture as planned move); when the safety level increases and

the countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level

volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8,

lines 15 – 35, lines 45 -55), the action determination means determines whether to keep current

countermeasures (col 8, lines 15 – 35, lines 45 -55).

    As for claim 15, Yamamoto discloses a control method of a robot apparatus having a

plurality of movable units, control method comprising: a first step of determining an action of

robot (Column 5, lines 11-25), a second step of, when an object is detected, detecting safety level

involving the object and movable units(Column 4 ,lines 40-50; Column 5, lines 18-26); and a

third step of moving movable units based on safety level detected and action determined to

mitigate or avoid danger (Abstract; Column 7, lines 18-25); wherein the action determined is

preprogrammed countermeasure corresponding to the detected safety level (Column 8, lines 40 -

Column 9, lines 20, control section 00; where the action corresponding to angle and acceleration

value of the robot respectively to the preprogrammed countermeasure in control section 100);

wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65

where the angle range is the safety level volume), capability of a joint angle, a timing of a

potential risk, and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine

tolerable angle range, capability of a joint angle; related to timing of a potential risk in

acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col

8,lines 40 - 55, restore to normal posture as planned move); determining whether to keep the

action when the safety level increases and the action is being performed (col 8, lines 20 – 65 the

angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a

different action (col 9, lines 5 - 20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102
of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject
matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art
to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claim 2, 7, 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Yamamoto (US Patent No. 6,330,494) in view of Furuta et al. (US Patent No. 6,902,015).

    As for claim 2, Yamamoto show all the elements of the claim 1 except safe space is defined

so as to correspond to each safety level status to be detected safety level status detecting means

and safety level detecting means detects safety level of safety level status based on a volume of
the safe space corresponding to the safety level status detected safety level status detecting
means. Furuta et al shows a safe space   (See Anteflex Region in Claim 1; Fig 4; Fig 5; Column
7, lines 5-17). It would have been obvious to one of ordinary skill in the art to modify the robot
apparatus of Yamamoto by setting the safe space for the robot of Furuta et al in order to provide
a joint axis range determination in angular degree.

    As for claim 7, Yamamoto show all the elements of the claim 6 except the safe space is
defined so as to correspond to each safety level status, and in first step, the safety level is
detected based on a volume of the safe space corresponding to the safety level status. Furuta et
al shows a safe space   (Claim 1; Fig. 4; Fig 5; Column 7, lines 5-17). It would have been
obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting
the safe space of Furuta et al in order to provide a joint axis range determination in angular
degree.

    As for claim 14, Yamamoto shows all the elements of the claim 13. Yamamoto does not
show safe spaces designated around movable units. Furuta et al shows safe spaces around
movable units (Claim 1; Fig 4; Fig 5; Column 7, lines 5 - 17).   It would have been obvious to
one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safe
space of Furuta et al in order to provide a joint axis range determination mean in angular degree.

As for claim 16, Yamamoto shows all the elements of the claim 15 and the control method in the second step. Yamamoto does not show safe spaces designated around movable units. Furuta et al shows safe spaces around movable units (Claim 1; Fig. 4; Fig 5; Column 7, lines 5-17). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safe space of Furuta et al in order to provide a joint axis range determination mean in angular degree.

5.   Claim 4, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (US Patent No. 6,330,494) in view of Hattori et al. (US Patent No. 6,463,356).

As for claim 4, Yamamoto shows all the elements in claim 3 except a control means performs control process so as to implement different countermeasures depending on whether position of safety level status is in an upper body or a lower body of robot apparatus. Hattori et al shows the control means performs control process so as to implement different countermeasures (See upper limbs, lower limbs in Column 20, lines 22 – 38; Column 21, lines 17-24) depending on whether position of said safety level status is in an upper body or a lower body of robot apparatus. It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the control means of Hattori et al in order to perform control process with respect to torso connecting components harmoniously in individual countermeasurement.

As for claim 9, Yamamoto shows all the elements in claim 9 except the control method in

second step, control process is performed so as to make robot apparatus implement different

countermeasures (Column 20, lines 22 – 38; Column 21, lines 17-24) depending on whether

position of safety level status is in an upper body or a lower body of robot apparatus. It would

have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto

by setting the control means of Hattori et al in order to perform control process with respect to

torso connecting components harmoniously in individual countermeasurement.

6.   Claim 5, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto

(US Patent No. 6,567,724) in view of Takahashi et al (U.S. Pat NO. 5,349,277).

As for claim 5, Yamamoto shows all the elements of the claim 1 except a robot apparatus

according to claim 1, wherein: a priority previously set according to a position of safety level

status and/or safety level of the safety level status; and control means, when safety level status

detecting means detects a safety level status with a higher priority while control process to

implement countermeasure is performed changes the control process so as to implement

countermeasures against the safety level status newly detected.   Takahashi et al shows priority is

previously seat according to a position of safety level status and/or safety level of the safety

level status (See " priority is established among the joints" in Column 8, lines 42- 61); and

control means, when safety level status detecting means detects a safety level status with higher

priority while control process to implement countermeasure is performed, changes the control

process so as to implement counter measurements against the safety level status newly detected

(Column 8, lines 42- 61). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safety level status priority and safety level status priority control means of Takahashi et al in order to provide movable unit movable priority synchronized along with other movable units and control means.

As to claim 10, Yamamoto shows all the elements of the claim 6 except a control method, wherein: a priority is previously set according to a position of safety level status and/or safety level of safety level status; and in second step, when a safety level status with a higher priority is newly detected while control process to make robot apparatus implement countermeasures is performed, the control process is changed so as to make the robot apparatus implement countermeasures against the safety level status newly detected. Takahashi et al teaches a priority is previously set according to a position of safety level status and /or safety level of safety level status (Column 8, lines 42- 61) ; and in second step, when a safety level status with a higher priority is newly detected while control process to make robot apparatus implement countermeasure is performed , the control process is changed so as to make the robot apparatus implement countermeasures against the safety level status newly detected(Column 8, lines 42- 61). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safety level status priority and safety level status priority control means of Takahashi et al in order to provide the movable unit movable priority synchronized along with other movable units and control means.

Response to Arguments

7.   Applicant's remark entered on August 24th, 2009 has been fully considered and reviewed but is not particularly persuasive.

8.   In response to applicant's remark that Yamamoto (U.S. Pat NO. 6,330,494) does not show a volume calculated as a function of a joint, a capability of joint angle, timing of a potential risk and a planned action. Applicant's attention is directed to Yamamoto, where the volume calculated as a function of a joint is the volume of the angle used as an function of a joint in Yamamoto; a capability of joint angle is the angle tolerable range specified in Yamamoto; timing of a potential risk is the acceleration information along with the updated time tag used for failure calculation in Yamamoto; a planned action is the postures information stored in memory using route planning data.

9.   In response to applicant's remark that Yamamoto does not show control means..to implement prescribed countermeasures according to safety level status. Applicant's attention is directed to Column 1, lines 45-55; See Control Section 100 in Column 7, lines 18-24; where the control section 100 is used to implement prescribed countermeasurement according to safety level status, where the countermeasurement is the restore to normal posture within the safety level status, which is obtained from the volume calculated as a function of a joint is the volume of the angle used as an function of a joint in Yamamoto and a capability of joint angle is the angle tolerable range specified in Yamamoto; where the determination is obtained from the control section 100, shown on col 8, lines 15 – 35, lines 45 -55.

Conclusion

10.   THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

   A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

   Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Ian Jen whose telephone number is 571-270-3274. The examiner can

normally be reached on Monday - Friday 8:00-5:00 (EST).

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Khoi Tran can be reached on 571-272-6916. The fax phone number for the organization where

this application or proceeding is assigned is 571-273-8300.

   Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call **800-786-9199 (IN USA OR CANADA)** or 571-272-**1000**.

/Ian Jen/
Examiner, Art Unit 3664
/KHOI TRAN/
Supervisory Patent Examiner, Art Unit 3664